

IMPACT ANALYSIS OF ISO 9001 CERTIFICATION ON SERVICE COMPANIES IN INDONESIA USING PLS-SEM

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ABSTRACT

More than one million organizations in the world has certified ISO 9001 to improve their performance related to quality, productivity and cost efficiency. The purpose of this study is to confirm that certification of ISO 9001 has positive impact to organization performance; to seek the significant factor which affecting to the effectiveness of implementation of ISO 9001 as well as organization performance and to confirm that organization performance has positive impact to customer. We have selected 80 certified ISO 9001 service companies more than 3 years (one cycle of certification) using simple random. Questioner to management representative of organization in implementation of ISO 9001 collected as primary data and then tested by Smart PLS 3.0. Evaluation found that certification of ISO 9001 has positive impact to organization performance (increase quality and productivity, reduce customer's claim and operational cost). Organization performance has impact to customer (customer satisfaction increasing, new customer attractive and repeat order). The significant factor, which has impact to organization performance are top management commitment, employee involvement, training and education, communication, and teamwork. This paper recommends that organization should maintain and improve the top management commitment, employee involvement, training and education, communication, and teamwork to increase organization performance.

KEYWORDS: ISO 9001, PLS-SEM, Impact Analysis & Performance

Received: Jan 10, 2019; **Accepted:** Jan 30, 2019; **Published:** Feb 27, 2019; **Paper Id.:** IJMPERDAPR201933

INTRODUCTION

ISO organization has conducted survey in 2016, which was published in September 2017 and the result is, more than one million organization has certified the QMS ISO 9001. Meanwhile, in Indonesia also the survey has shown that since 1993 – 2016, more than eight thousand organizations has been certified QMS ISO 9001.

In this research, author will attest if implementation and certification of QMS ISO 9001 has positive impact to organization performance. Beside, to seek the significant factor that affect the effectiveness of QMS ISO 9001 implementation as well as the organization performance (quality, productivity, cost efficiency and customer complaint). In addition to attesting, if organization performance has impact to customer satisfaction.

LITERATURE REVIEW

Quality Management Iso 9001

Juran (1989) stated Quality is fitness of use, so quality is defined by customer. Customer satisfaction will achieve if desire of customer fulfilled. However, quality is uniformity and reliability at low cost and market accepted (Deming, 1996). Quality is customer's perspective (Deming, 1996; Juran, 1989).

Quality is manufacturer or provider's perspective (Crosby, 1984). Quality is just conformity to the

requirements or specifications. Therefore, quality is defined as integrity that means just delivers what promised.

Quality from perspective of customer is including performance, feature, conformance, durability, marketing, aesthetic and perceived quality (Garvin, 1988).

Quality management is how the organization designs and implements the system to achieve that quality specifications or requirements (Freeman-Bell and Grover, 1994). Meanwhile, Dean and Bowen (1984) concluded that quality management system is built by three main components that include customer focus, process control and continual improvement.

QMS ISO 9001: 2008 provides a guideline to create their quality management system by establishing of procedure, control and documentation (Sun et. al, 2004). According to Goetsch and Davis (2005), the goal of implementation of QMS ISO 9001 is to provide consistency of product/service, meet customer requirements and regulatory requirements, and customer satisfaction and continuous improvement, noncompliance prevention. Organizations that carry out voluntary and positive certification processes across broad-based dissemination tend to report on organizational performance improvements from organizations driven by customer pressure (Terziovski et al., 2003)

ISO 9001 Implementation and its Benefit

Tari et. al (2012) reviewed many articles related ISO 9001 concluded that, the benefit of ISO 9001 can be classified to be thirteen categories as the following: improvement quality product / service, improve image, employee satisfaction, market share, export, profitability, sales and sales growth, competitive advantage, relationship with authorities and stakeholders, administration benefit (procedure), efficiency and supplier relationship,.

Successfully Factors and Barriers of Implementation of ISO 9001

Poksinksa et al. (2006) found that the involvement and commitment of employees working for the organization, top management commitment, continuous improvement, and training and education and employee documentation are successful factors for implementation of ISO 9001.

Top Management commitment, motivation, financial, continuous improvement and audit are significant factors on the implementation of QMS ISO 9001 (Kaziliunas, (2010).

Albadran, (2014) lists barriers of ISO 9001 implementation such as top management commitment, lack of financial resources, customer satisfaction, internal audit difficulties, employee resistance, and unwillingness to change systems.

Psomas and Antony (2015) found that the impact of certain critical factors such as quality system attributes, company attributes, internal motivation, external environmental stresses, employee characteristics that affect to the effectiveness of ISO 9001 implementation.

Meanwhile, Jayasundara and Rajini, (2014) found that internal support from management and staff, good management and good knowledge of quality management systems, goals and quality management targets integrated with business goals, as key enabler in ISO 9001 implementation. Fuentes et al., (2000) found the factor which effect to the successfully ISO 9001 implementation is top management commitment, early training, employee engagement, and cooperative customer and supplier attitude.

Gopal and Rajesh (2017) found the following factors that affecting to the effectiveness of QMS ISO 9001 are Commitment and involvement of top management, Communication, Staff support and involvement, Teamwork, Training and education, Motivation and audit.

Partial Least Square – Structural Equation Modelling

Partial least square or commonly abbreviated as PLS is a type of statistical analysis, whose usefulness is similar to SEM in covariance analysis. Because it is similar to SEM, the basic framework in PLS used is based on linear regression. So, what is in linear regression, also exists in PLS. It's just given a different symbol or term.

Partial least square is a multivariate statistical technique that can handle many response variables and explanatory variables at once. This analysis is a good alternative for the method of multiple regression analysis and main component regression, because this method is more robust or immune. Robust means that the model parameters do not change much, when new samples are taken from the total population. Partial Least Square is a predictive technique that can handle many independent variables, even if multicollinearity occurs between these variables (Wong, 2013).

According to Wold, PLS is a powerful analytical method, because it is not based on many assumptions or conditions, such as normality and multicollinearity tests. The method has its own advantages, among others: data does not have to be normally multivariate. Even indicators with data scale categories, ordinal, interval to ratio can be used. Another advantage is that the sample size does not have to be large.

Although Partial Least Square is used to confirm the theory, it can also be used to explain whether or not there is a relationship between latent variables. Partial Least Square can analyze both constructs formed with reflexive indicators and formative indicators, and this is not possible in the Structural Equation Model (SEM) because there will be an unidentified model. PLS has two indicator models in its depiction, namely: Reflexive Indicator Model and Formative Indicator Model.

Function of Partial Least Square

- Partial Least Square is an analysis, whose main function is to design a model, but can also be used to confirm the theory.
- PLS does not need many conditions or assumptions such as SEM. What is SEM, I will explain later in other articles.
- Partial Least Square functions when grouped lay; there are 2, namely inner model and outer model. The outer model is more towards the validity and reliability test. While the inner model is more towards regression, namely to assess the effect of one variable on other variables.
- The compatibility of models in Partial Least Square is not like SEM where there are global matches, such as RMSEA, AGFI, PGFI, PNFI, CMIN / DF, etc. In PLS there are only 2 criteria for assessing the suitability of the model, namely the compatibility of the outer model called the outer model and the inner suitability called the inner model. So, the point of point 3 above is to explain this point 4. For the compatibility of the outer model there are 2, namely reflective measurements and formative measurements, which have been described above.
- Assessment of the suitability of the outer model or outer model include: Reliability and validity of reflective latent variables and the validity of formative latent variables.

- Assessment of the suitability of the inner model includes: Explanation of variants of endogenous latent variables, measures of influence contributed and relevance in predictions.

METODOLOGY

Based on the literature review, a model of research was determined. The outer factors are finance, Top Management commitment, Good communication, Employee involved, adequacy of finance, Training and education, motivation, and external audit from certification body. The inner factors are performance of organization and impact to customer as seen the figure 1.

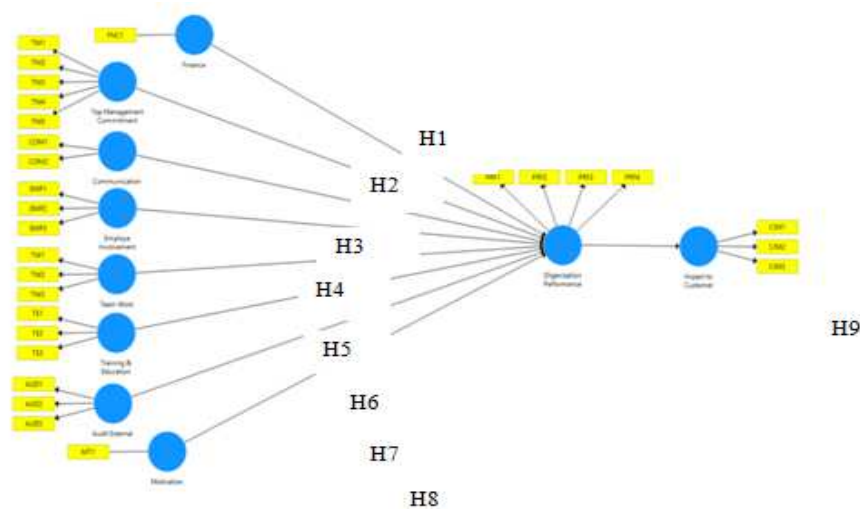


Figure 1: Research Model

Consequently, research hypothesis regards the critical factor to the effectiveness of QMS ISO 9001 implementation as well as organization performance. The hypotheses of this research are as follows:

- H1:** The Financial supports have positive effect on organization's performance
- H2:** Top Management commitment has positive effect on organization's performance
- H3:** Communications have positive effect on organization's performance
- H4:** Employee involved has positive effect on organization's performance
- H5:** Team works have positive effect on organization's performance
- H6:** Training and education have positive effect on organization's performance
- H7:** External Audit has positive effect on organization's performance
- H8:** Motivation have positive effect on organization's performance
- H9:** Organization performance has positive effect to impact to customer

Data were collected from certified ISO 9001 companies more than 3 years, or one cycle certification will be examined using Smart PLS 3.0 to evaluate the reliability and validity of research model, and also to assess the research hypotheses. Through a Google drive (n=80) questionnaire data will be collected.

RESULTS

Evaluation of Measurement Model (Outer Model)

- Internal Consistency Reliability

Table 1: Composite Reliability

| Variable Laten | CR |
|---------------------------|-------|
| Audit External | 0.918 |
| Communication | 0.904 |
| Employee Involvement | 0.923 |
| Finance | 1.000 |
| Impact to Customer | 0.868 |
| Motivation | 1.000 |
| Organization Performance | 0.916 |
| Team Work | 0.924 |
| Top Management Commitment | 0.953 |
| Training & Education | 0.921 |

- Indicator Reliability

Table 2: Indicator Reliability

| Indicator | Outer Loading | Remarks |
|-----------|---------------|---------|
| AUD1 | 0.950 | > 0.7 |
| AUD2 | 0.845 | > 0.7 |
| AUD3 | 0.869 | > 0.7 |
| CIM1 | 0.801 | > 0.7 |
| CIM2 | 0.870 | > 0.7 |
| CIM3 | 0.812 | > 0.7 |
| COM1 | 0.950 | > 0.7 |
| COM2 | 0.865 | > 0.7 |
| EMP1 | 0.936 | > 0.7 |
| EMP2 | 0.868 | > 0.7 |
| EMP3 | 0.880 | > 0.7 |
| PRF1 | 0.869 | > 0.7 |
| PRF2 | 0.785 | > 0.7 |
| PRF3 | 0.935 | > 0.7 |
| PRF4 | 0.828 | > 0.7 |
| TE1 | 0.942 | > 0.7 |
| TE2 | 0.861 | > 0.7 |
| TE3 | 0.870 | > 0.7 |
| TM1 | 0.963 | > 0.7 |
| TM2 | 0.874 | > 0.7 |
| TM3 | 0.890 | > 0.7 |
| TM4 | 0.889 | > 0.7 |
| TM5 | 0.858 | > 0.7 |
| TW1 | 0.942 | > 0.7 |
| TW2 | 0.873 | > 0.7 |
| TW3 | 0.869 | > 0.7 |

- **Convergent Validity**

Table 3: Average Varian Extracted

| Variable Laten | AVE |
|---------------------------|-------|
| Audit External | 0.790 |
| Communication | 0.825 |
| Employee Involvement | 0.801 |
| Finance | 1.000 |
| Impact to Customer | 0.687 |
| Motivation | 1.000 |
| Organization Performance | 0.733 |
| Team Work | 0.802 |
| Top Management Commitment | 0.802 |
| Training & Education | 0.795 |

- **Discriminant Validity**

Table 4: Fornell-Larcker Criterion

| Variable Laten | Audit External | Communication | Employee Involvement | Finance | Impact to Customer | Motivation | Organization Performance | Team Work | Top Management Commitment | Training & Education |
|---------------------------|----------------|---------------|----------------------|---------|--------------------|------------|--------------------------|--------------|---------------------------|----------------------|
| Audit External | 0.889 | | | | | | | | | |
| Communication | 0.575 | 0.908 | | | | | | | | |
| Employee Involvement | 0.526 | 0.372 | 0.895 | | | | | | | |
| Finance | 0.204 | 0.107 | 0.279 | 1.000 | | | | | | |
| Impact to Customer | 0.489 | 0.570 | 0.490 | 0.423 | 0.829 | | | | | |
| Motivation | 0.327 | 0.418 | 0.219 | 0.172 | 0.347 | 1.000 | | | | |
| Organization Performance | 0.594 | 0.606 | 0.603 | 0.281 | 0.765 | 0.342 | 0.856 | | | |
| Team Work | 0.450 | 0.473 | 0.451 | 0.325 | 0.509 | 0.224 | 0.639 | 0.895 | | |
| Top Management Commitment | 0.264 | 0.115 | 0.150 | 0.069 | 0.354 | 0.104 | 0.399 | 0.258 | 0.896 | |
| Training & Education | 0.317 | 0.411 | 0.396 | 0.210 | 0.622 | 0.267 | 0.563 | 0.410 | 0.006 | 0.892 |

Evaluation of structural measurement (Inner model)

- **Collinierity Assessment**

Table 5: Vif Inner Model

| Latent Variable | Impact to Customer | Organization Performance |
|---------------------------|--------------------|--------------------------|
| Audit External | | 1.918 |
| Communication | | 1.895 |
| Employee Involvement | | 1.602 |
| Finance | | 1.183 |
| Motivation | | 1.263 |
| Organization Performance | 1.000 | |
| Team Work | | 1.693 |
| Top Management Commitment | | 1.137 |
| Training & Education | | 1.405 |

- Structural Model Path Coefficient

Table 6: Coefficient and Effect Evaluation of Structural Model

| Effect | Coefficient | T Statistics | P Values |
|---|-------------|--------------|--------------|
| Audit External -> Organization Performance | 0.092 | 0.996 | 0.320 |
| Communication -> Organization Performance | 0.227 | 2.979 | 0.003 |
| Employee Involvement -> Organization Performance | 0.225 | 2.907 | 0.004 |
| Finance -> Organization Performance | 0.034 | 0.483 | 0.630 |
| Motivation -> Organization Performance | 0.022 | 0.331 | 0.741 |
| Organization Performance -> Impact to Customer | 0.765 | 18.958 | 0.000 |
| Team Work -> Organization Performance | 0.203 | 2.541 | 0.011 |
| Top Management Commitment -> Organization Performance | 0.257 | 3.822 | 0.000 |
| Training & Education -> Organization Performance | 0.253 | 3.697 | 0.000 |

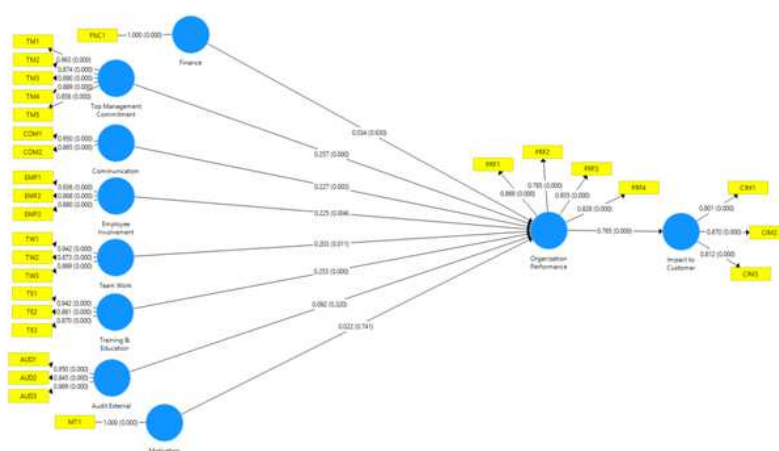


Figure 2: Result of Structural Model

- Coefficient Determination

Table 7: Determination Coefficient

| Latent Variable | R ² |
|--------------------------|----------------|
| Impact to Customer | 0.585 |
| Organization Performance | 0.720 |

- Effect Size

Table 8: Effect Size

| Latent Variable | Impact to Customer | Organization Performance |
|---------------------------|--------------------|--------------------------|
| Audit External | | 0.016 |
| Communication | | 0.097 |
| Employee Involvement | | 0.113 |
| Finance | | 0.003 |
| Motivation | | 0.001 |
| Organization Performance | 1.408 | |
| Team Work | | 0.087 |
| Top Management Commitment | | 0.207 |
| Training & Education | | 0.163 |

- **Predictive Relevant**

Table 9: Predictive Relevant

| Latent Variable | Q ² |
|--------------------------|----------------|
| Impact to Customer | 0.368 |
| Organization Performance | 0.468 |

CONCLUSIONS

Based on the analysis and discussion in this study, it is concluded that the implementation of ISO 9001 QMS has a positive impact on the performance of service companies with improved service quality indicators, increased productivity, decreased customer complaints and reduced operational costs

All variables tested namely external audit, communication, employee involvement, finance, motivation, team work, top management commitment and training & education have a positive influence on organization performance. But of all that, which has a significant influence on organization performance is communication, employee involvement, team work, top management commitment and training & education

The influence of organization performance on impact to customer can be seen that, organization performance has a significant positive impact to customer. This means that, better the organization performance, better is the impact to the customer.

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